



**Towarzystwo Gospodarcze  
Polskie Elektrownie**

# Data collection in energy sector LCP BREF Revision

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## What are LCPs?

- LCP stands for Large Combustion Plant;
- ≈4000 in EU;
- Large share of air pollutant emissions 46% SO<sub>2</sub>, 18% NO<sub>x</sub>, 4% Dust, 39% Hg;
- Present in many industries e.g. refineries, steelworks, pulp and paper, offshore platforms, electricity generation;
- Different fuels: coal, lignite, natural gas, biomass, fuel oil;
- Old LCP BREF dates in 2006 (under IPPCD)

## IED is the main EU instrument regulating pollutant emissions from industrial installations.

- Around 50 000 installations
- Aims to reduce: harmful industrial emissions to air and water; noise emissions; resource use (energy, water, material) in line with circular economy objectives.
- Greater harmonisation of requirements
- Requires permits and use of Best Available Techniques (BAT)
- Permit conditions must include emission limit values (ELVs) for all relevant pollutants based on the use of BAT
- BAT conclusions legally binding
- Information exchange to draw up, review & update BREFs formalised in Commission Implementing Decision (2012/119/EU)



## What is a BREF?

- Reference document for MS competent authorities issuing IED permits
- Covers an industry sector or sub-sector
- Technical Working Group (TWG) is at the heart of process
- TWG comprises experts from MS and stakeholders
- **Extensive data gathering and discussion with TWG**
- **Identification of BAT based on plant data**
- Detailed rules are set out in Commission Decision
- BREFs published here: <http://eippcb.jrc.ec.europa.eu/reference/>

## BAT information exchange (Technical Working Group)

Member State  
experts

Industry  
experts



Commission  
(IPPC Bureau + DG ENV)

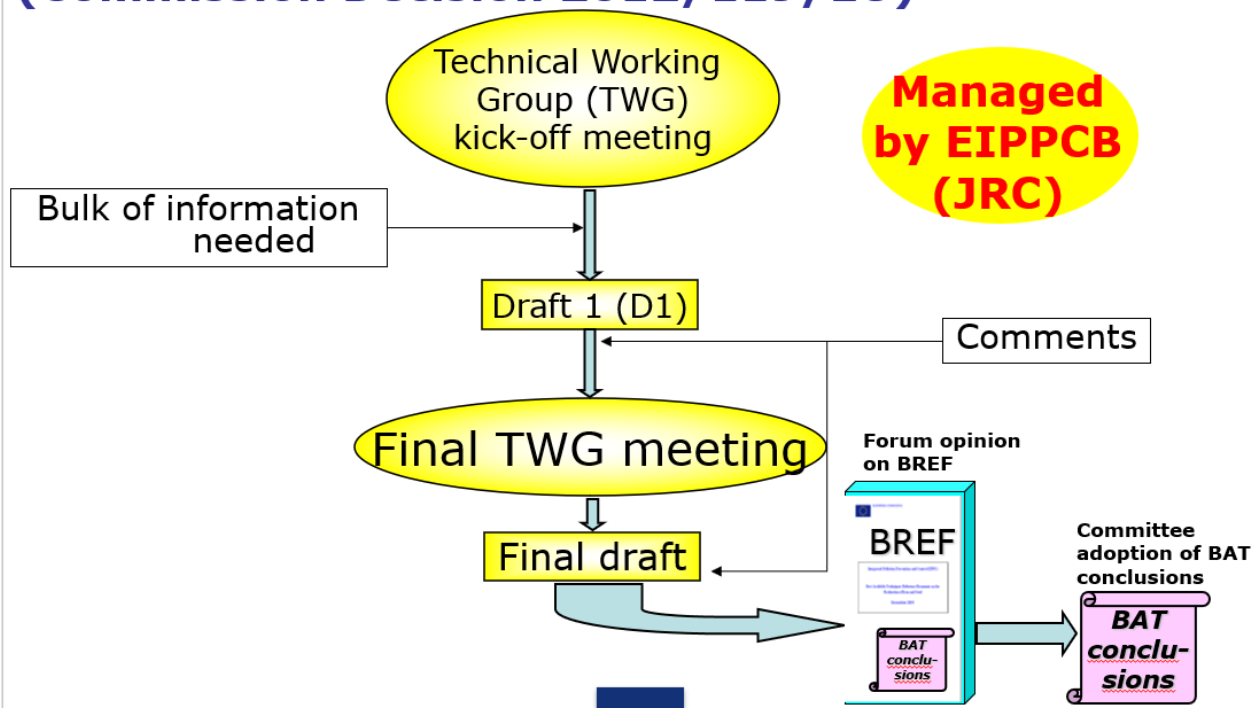
NGO  
experts

Installation level data  
(techniques, emissions, ...)

BREF (BAT reference document  
(with BAT conclusions))



## BREF process (Commission Decision 2012/119/EU)





## LCP BREF review

- Started early 2011;
- 6 year's work;
- 291 TWG members;
- 580 plant level questionnaires;
- 24 Site visits in 7 Member States;
- Specific working groups e.g. gasifiers and energy efficiency;
- 8510 Comments to D1 with 200 attached documents;
- 225 reports and case studies reviewed.



<i>LCP BREF review main steps</i>	<i>Date</i>
TWG reactivation	1/2011
Call for wishes	3/2011
Kick-off meeting	10/2011
Collection of information (deadline)	6/2012
Draft 1	6/2013
Commenting period, 8510 comments (deadline)	9/2013
24 Site visits in 7 Member States (until)	10/2013
Additional data collection for averaging periods	3-6/2014
Informal intermediate TWG meeting	6/2014
Data collection on energy efficiency (deadline)	10/2014
Draft revised BAT conclusions + background paper	4/2015
Final TWG Meeting	6/2015
"Leftovers" webinar and written consultation	6-9/2015
Revised draft BREF after final TWG meeting	2/2016
Final Draft for the opinion of the IED Article 13 Forum	6/2016
IED Article 13 Forum meeting	10/2016
Publication of Forum opinion	11/2016



All member states of EU voted in regard to adoption of new air pollution limits – known as BREF

- 28th of April 2017 in Brussels

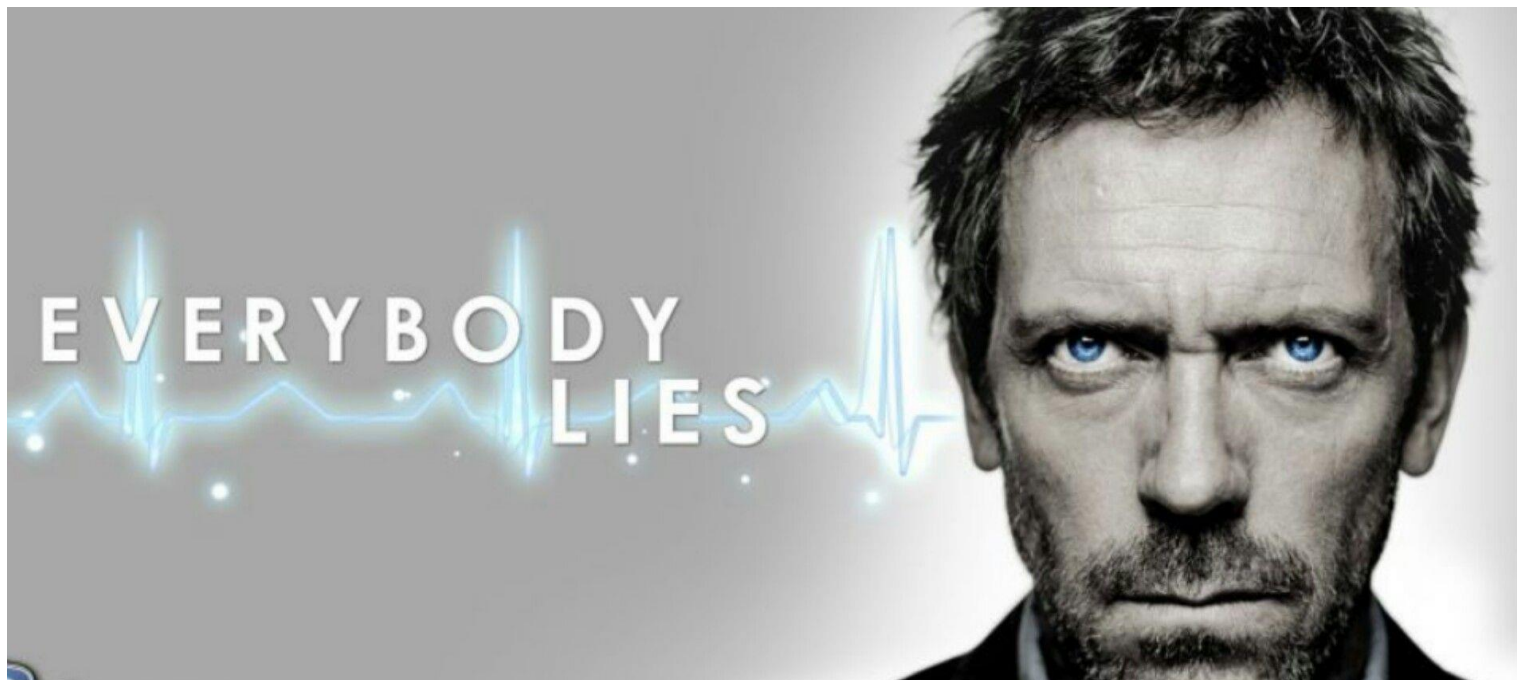
- 28 member states

**28** member states  
Minimum "Yes" required for adoption: (55%) 16



**%** Population  
Minimum "Yes" required for adoption: 65%





- Questionnaire – 20 excell sheets with all aspects of LCP functioning, very complex
- But – did not take into account differences in unit configurations (definitions of plant / unit / installation)
- Measurement uncertainty - not regulated in the EU legislation

ELV 100		90		110		120		
	Method	Reported	Subtracted	Reported	Subtracted	Reported	Subtracted	Max
UK	20% MV	72	18	88	22	96	24	125
NL	20% ELV	70	20	90	20	100	20	120
FR	20% MV or 20% ELV if lower then MV	72	18	90	20	100	20	120
DE	Measurment SD	85,5	4,5	104,5	5,5	114	6	105,26

MV - measured value

ELV – emission limit value from the permit

SD - standard deviation

Max - maximum measured value not exceeding ELV



- 580 plant level questionnaires (on c.a. 4000 plants)
- During the process not all cases were found to be represented
- Example – combination of FBC boilers + coal with high chlorine content
  - HCl – secondary pollutant, not mentioned in air quality, LCPD, CAFE, HRAPIE, no indicators to analyze environmental costs
  - FBC boiler – compact, can deal with SO<sub>x</sub> without secondary abatement methods (FGD)
  - ....but efficiency of chlorine removal is much lower: 10 to 50 %, especially with high chlorine contents in coal.
  - Chlorine content in polish hard coal is in the range between 0,05 % to 0,6 %. It is higher than in other coals
  - HCl concentrations in flue gasses from FBC boilers fuelled with polish local hard coals typically could be in the range of 60 – 450 mg/Nm<sup>3</sup>

- The BAT AELs for HCl in BAT Conclusions (1-5 mg/Nm<sup>3</sup>) are based on questionnaires data for units with boilers fitted mainly with FGD (see fig 1: fig 5.33 from Draft 1 of LCP BREF).
- This figure do not take into account FBC HCl data, only one European existing FBC with DSI equipment was identified, but data on HCl emissions and Cl content in the fuel were incomplete.
- Generally data on HCl and HF concentrations in flue gasses and Cl and F in coals in questionnaires are poor.

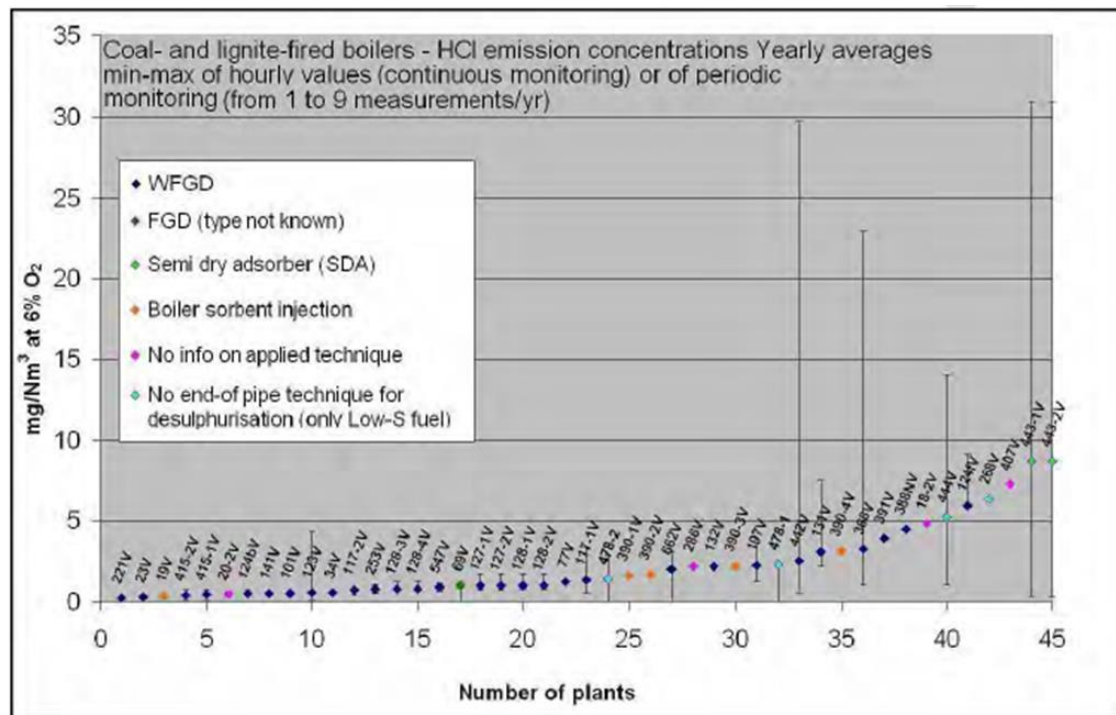
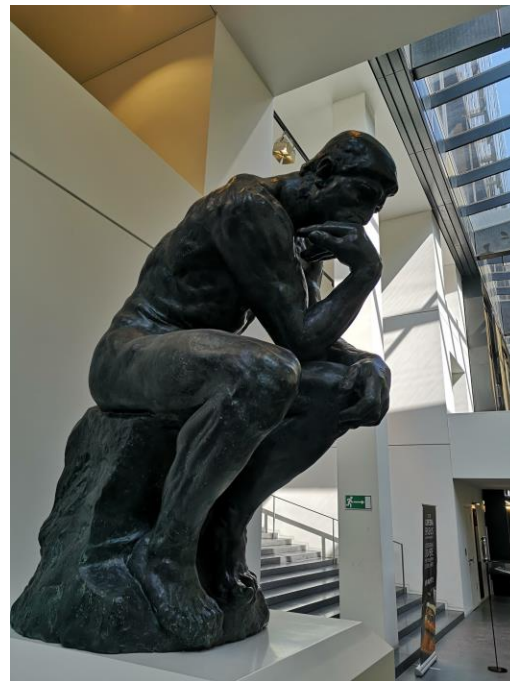


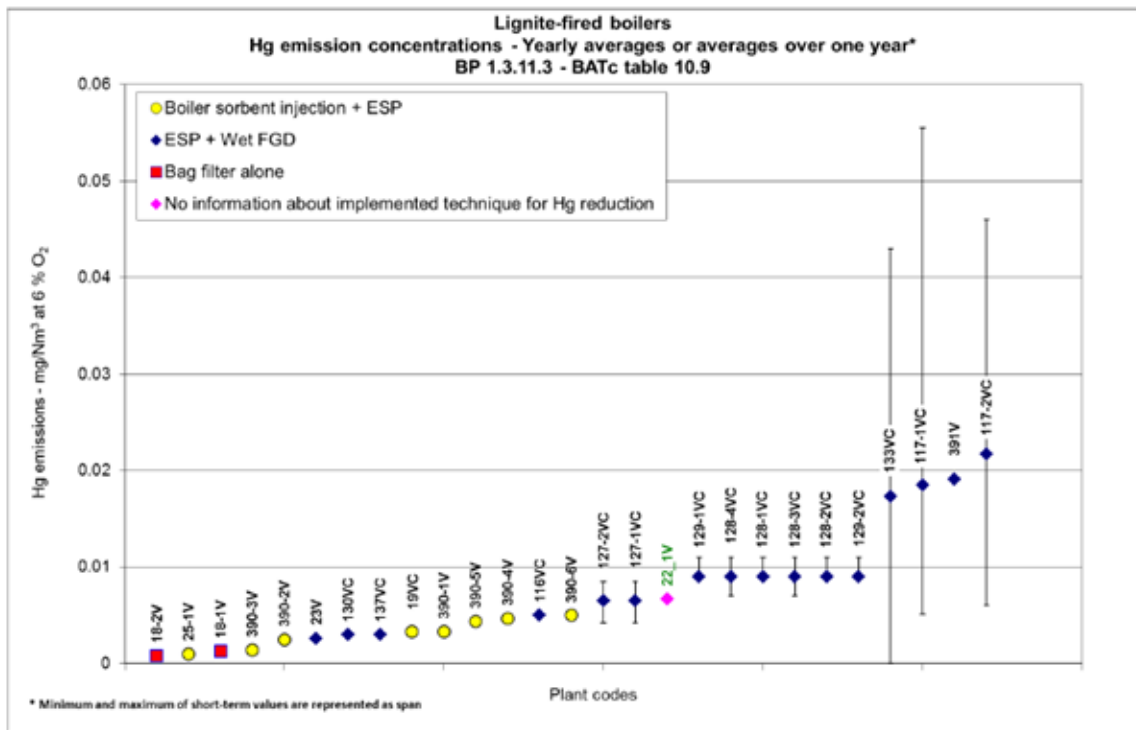
Figure 5.33: HCl emissions from coal- and lignite-fired plants

- It was extremely hard to change this during the process
- ...the continuation of bad coincidences:
  - not important to others
  - last on the pollutant list
  - discussion continued in written procedure after the final meeting
- Consequences:
  - Obligation to spent c.a. 10-20 mln EUR per installation to deal only with HCl
  - Case T-699/17 – Poland vs. European Commission



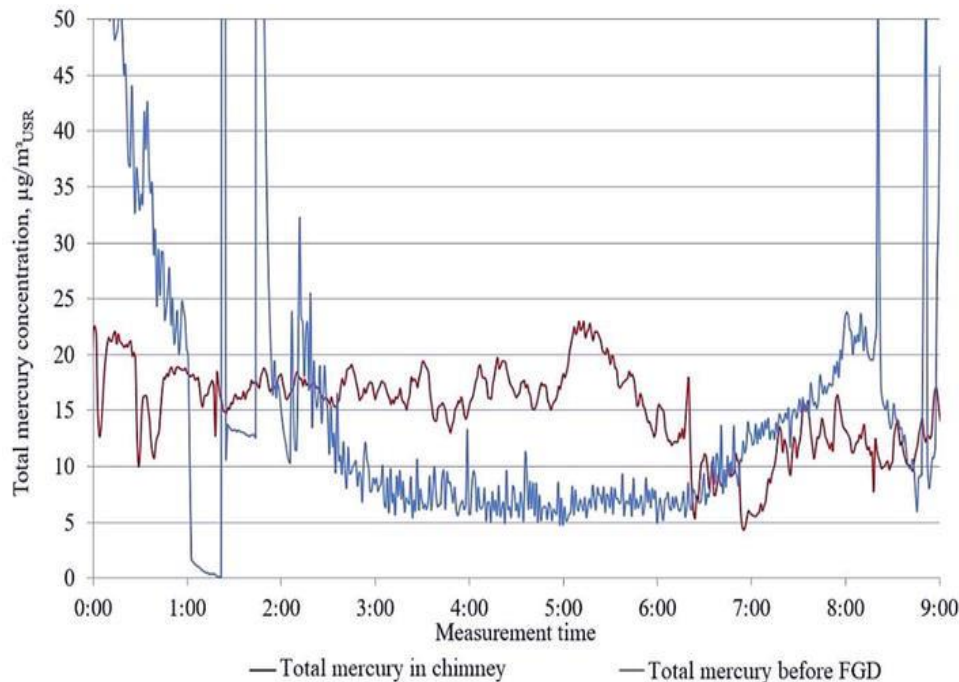
## Mercury (Hg)

- prior to BATc periodic monitoring only, after – continuous
- high uncertainty of results, often near the detection threshold of measuring devices





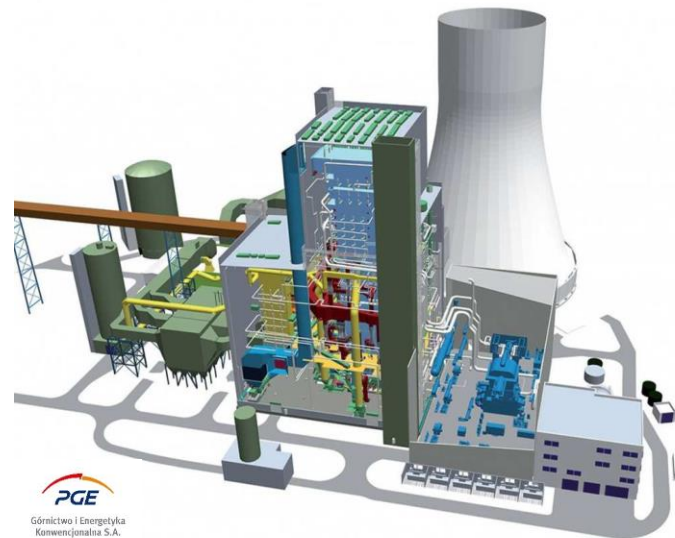
- After a analysis (post factum) of 13 out of 17 objects, on the basis of which the IPPCBureau set the BAT limit for Hg, errors or the lack of correct measurements were identified, f.e. calculated values, measurements without accreditation etc.
- The 4 remaining plants carried out only **42 periodic** measurements.
- 3 plants presented the most reliable data on Hg emissions, as they conducted continuous measurements with the number of **several thousand measurements** per year. And all of them was rejected.
- Consequences:
  - 2x stricter limits, with 4 years to develop and implement techniques
  - Case T-699/17 – Poland vs. European Commission





## NOx for new lignite plant with SCR technique

- 1 installation in europe – no data, problems with operation
- Partial data from 1 installation in USA:
  - with different fuel parameters – comparable with european hard coal not lignite
  - Without strict limits for CO and SO<sub>2</sub>
- Consequences:
  - redesign plant under contruction (800 mln EUR investment), develop & implement new technique (combined reduction of NOx and Hg)
  - Case T-699/17 – Poland vs. European Commission



# Data comparison

OECD - BAT Project Activity 6 –  
Cross Country analysis of  
selected sectors for  
comparison

difficult to compare - different  
conditions of compliance,  
averages etc.

Dust (PM)		
BREF	BAT AELs specified	
	New Plant	Existing Plant
China	20 mg/m <sup>3</sup>	
EU	2-5 mg/m <sup>3</sup> all sizes	2 – 18 mg/m <sup>3</sup> (ranges for different size plant)
India	30 mg/m <sup>3</sup>	2003 to 2016: 50 mg/m <sup>3</sup> < 2003: 100 mg/m <sup>3</sup>
Japan	<ul style="list-style-type: none"> <li>Only efficiency levels in supplied BAT tables</li> </ul>	
Russia	< 1981 1200 mg/m <sup>3</sup> >100 MW 1982 – 2000 900 mg/m <sup>3</sup> After 1 Jan 2000, 250 mg/m <sup>3</sup>	
Korea	50-100 MW 3 – 15 mg/m <sup>3</sup> 100MW 2- 15 mg/m <sup>3</sup>	
USA	13 mg/m <sup>3</sup>	420 mg/m <sup>3</sup>
World Bank	<1000MW 30 – 50 mg/m <sup>3</sup> >1000MW 25 – 40 mg/m <sup>3</sup>	
		Ref p3 No new / existing distinction Larger existing plant lower ranges e.g. 2 – 10 > 600 MW Figures given left are yearly averages Daily average ranges set according to plant size within overall range of 4 – 22 mg/m <sup>3</sup> Up to 14 - 28 mg/m <sup>3</sup> yearly average for plants operating before 7 Jan 2014 (size dependent) Ref: Env Protection Act Amendment Rules 2015 SO 3305 (E) New plant from 1 Jan 2017 PM values corrected to 6 % oxygen on dry base
		Ref 252 1982 – 2000 50 – 100 MW 1000 mg/m <sup>3</sup>
		Ref p 581
		Ref 40 CFR 60.42Da & 77 Fed Reg 9304 Ref 40 CFR 63 UUUUU Table 1 & 78 Fed Reg 24073
		P35 New plant only

- *There are three kinds of lies: Lies, Damned Lies, and Statistics [Mark Twain]* – data at every stage of decision making process need to be cross checked and verified, because it's the best way to influence
- Even raw data may be misleading without full context and background
- Availability, quantity and quality - everything must be at a high level





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# Thank You

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